WindSat

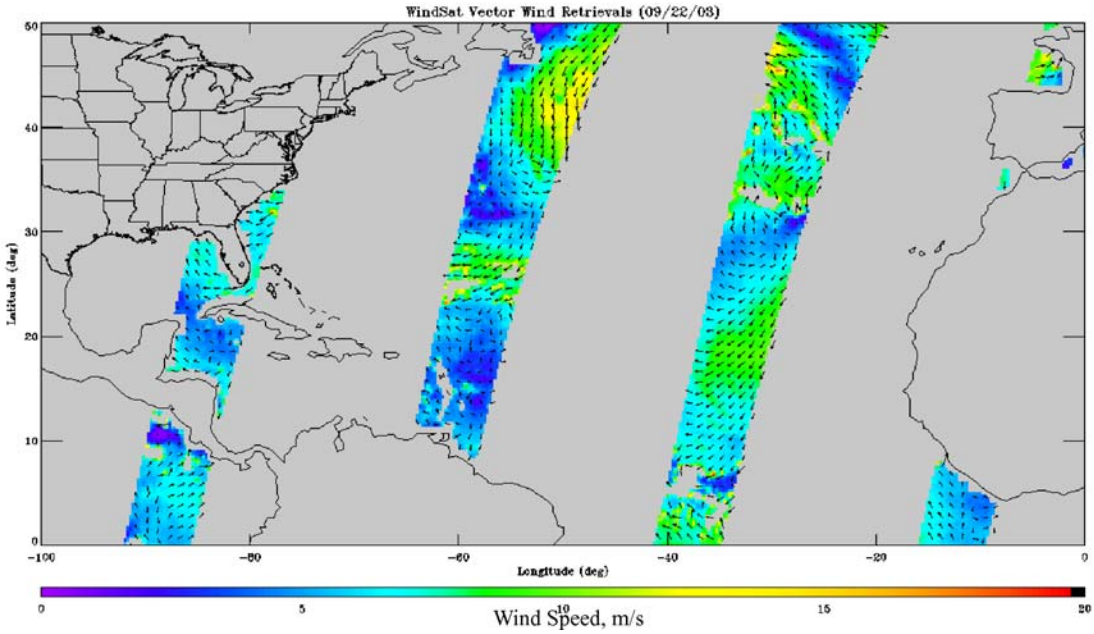
WindSat, launched January 6, 2003, is the first spaceborne polarimetric microwave radiometer, developed and built by the U.S. Naval Research Laboratory, to demonstrate ocean surface wind vector retrievals. WindSat is the primary payload on the DOD Space Test Program's Coriolis Mission. The Payload provides risk reduction data that the National Polar orbiting Operational Environmental Satellite System (NPOESS) Integrated Program Office (IPO) will use in the development of the Conical Microwave Imager Sounder (CMIS). Polarimetric radiometry characterizes the polarization properties of the surface emission by measuring the radiometric Stokes vector. Multiple airborne experiment campaigns have demonstrated that the microwave emission from the ocean surface varies not only as a function of wind speed, but also the wind direction. Stokes vector measurements from these campaigns have been used to retrieve the ocean surface wind vector.

Benefits:

- Provides Navy Unique/Mission Critical Sensors and Proof of Concept for Use on NPOESS Satellites
  - Current Emphasis Is on Real Time Ocean Surface Wind Speed and Direction
- Real-Time On-Scene Tactical Support and Battlespace Awareness (Enables Tactical Decision Aids)
  - Critical to Precision Guided Munitions, Mission Planning, P(K) Effectiveness
  - Avoidance of Nuclear Biological and Chemical (NBC) Agents
  - Optimum Ship Routing and Tropical Cyclone Avoidance

– Surf Index-Amphibious Assault and Special Operations
– Search and Rescue Operations

- Program's Relationship to Joint Arena
  – Navy Commitment to Joint DOD (DMSP) and Merged DOD/DoC National (NPOESS) Satellite Programs
  – Navy Lead in Developing/Maintaining NPOESS Ocean Remote Sensing Technology



The above image presents some of the earliest retrievals of wind vectors from WindSat. These wind data were produced by a preliminary wind vector retrieval algorithm developed in collaboration between NRL and JPL. The colors represent wind speeds. The WindSat program is currently in calibration and validation phase. The instrument performance is being tuned and the wind retrieval algorithms tested and validated.

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